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HOW COMPETENT ARE PEOPLE WHO USE OPIOIDS AT RESPONDING TO OVERDOSES? QUALITATIVE ANALYSES OF ACTIONS AND DECISIONS TAKEN BY LAY FIRST-RESPONDERS DURING OVERDOSE EMERGENCIES

Joanne Neale (Corresponding author)

Professor of Addictions Qualitative Research, National Addiction Centre, King's College London, United Kingdom

Conjoint Professor, Centre for Social Research in Health, University of New South Wales, Australia

Caral Brown

Visiting Researcher, National Addiction Centre, King's College London, United Kingdom

Aimee N. C. Campbell

Associate Professor of Clinical Psychiatric Social Work, Division on Substance Use Disorders, Columbia University Medical Center and New York State Psychiatric Institute, United States

Jermaine D. Jones

Associate Professor of Clinical Neurobiology (In Psychiatry), Division on Substance Use Disorders, Columbia University Medical Center and New York State Psychiatric Institute, United States

Verena E. Metz

Postdoctoral Researcher, Division on Substance Use Disorders, Columbia University Medical Center and New York State Psychiatric Institute, United States

***John Strang**

Professor of the Addictions, National Addiction Centre, King's College London, United Kingdom

***Sandra D. Comer**

Professor of Neurobiology (In Psychiatry), Division on Substance Use Disorders, Columbia University Medical Center and New York State Psychiatric Institute, United States

***co-last authors**

RUNNING HEAD: OVERDOSE COMPETENCY: ACTIONS AND DECISIONS

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CONFLICT OF INTEREST/ DISCLOSURES

J.N. receives honoraria and some expenses from *Addiction* journal in her role as Commissioning Editor and Senior Qualitative Editor. J.S. is a researcher and clinician who has advocated for wider pre-provision of take-home naloxone, using several types of naloxone. He has also worked with pharmaceutical companies to seek to identify new or improved treatments (including forms of naloxone) from whom he and his employer (King's College London) have received honoraria, travel costs and/or consultancy payments. This includes work with, during past 3 years, Martindale, Indivior, MundiPharma, Braeburn/Camurus and trial medication supply from iGen and from Camurus. His employer (King's College London) has registered intellectual property on a novel buccal naloxone formulation and he has also been named in a patent registration by a Pharma company regarding a concentrated nasal naloxone spray. For a fuller account, see J.S.'s web-page at <http://www.kcl.ac.uk/ioppn/depts/addictions/people/hod.aspx>. S.D.C. has received compensation (in the form of partial salary support) from studies supported by Alkermes, Braeburn Pharmaceuticals, Cerecor Inc., Endo Pharmaceuticals, Indivior PLC/Reckitt-Benckiser Pharmaceuticals, Johnson & Johnson Pharmaceutical Research & Development, MediciNova, Omeros, and Schering-Plough Corporation. In addition, S.D.C has received compensation from Grunenthal GmbH to conduct a meta-analysis of drug-induced subjective responses and she served as a consultant to the following companies: Analgesic Solutions, AstraZeneca, BioDelivery Sciences International, Cephalon, Clinilabs, Daiichi Sankyo, Egalet, Endo, Inflexxion, Innovative Science Solutions, Janssen, KemPharm, King, Lightlake (now Opiant), Mallinckrodt, Neuromed, Pfizer, and Salix. C.B., A.N.C.C., J.D.J. and V.E.M. have no disclosures to report.

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**HOW COMPETENT ARE PEOPLE WHO USE OPIOIDS AT RESPONDING TO
OVERDOSES? QUALITATIVE ANALYSES OF ACTIONS AND DECISIONS TAKEN
BY LAY FIRST-RESPONDERS DURING OVERDOSE EMERGENCIES**

ABSTRACT

Background and aims: Providing take-home naloxone (THN) to people who use opioids is an increasingly common strategy for reversing opioid overdose. However, implementation is hindered by doubts regarding the ability of people who use opioids to administer naloxone and respond appropriately to overdoses. We aimed to increase understanding of the competencies required and demonstrated by opioid users who had recently participated in a THN program and were subsequently confronted with an overdose emergency.

Design: Qualitative study designed to supplement findings from a randomized controlled trial of overdose education and naloxone distribution. Interviews were audio-recorded, transcribed, systematically coded, and analyzed via Iterative Categorization.

Setting: New York City, USA.

Participants: 39 people who used opioids (32 men, 7 women; ages 22-58 years).

Intervention: Trial participants received brief or extended overdose training and injectable or nasal naloxone.

Measurements: The systematic coding frame comprised deductive codes based on the topic guide and more inductive codes emerging from the data.

Findings: In 38/39 cases the victim was successfully resuscitated; the outcome of one overdose intervention was unknown. Analyses revealed five core overdose response ‘tasks’: 1. Overdose identification; 2. Mobilizing support; 3. Following basic first aid instructions; 4. Naloxone administration; and 5. Post-resuscitation management. These tasks comprised actions and decisions that were themselves affected by diverse cognitive, emotional, experiential, interpersonal

and social factors over which lay first-responders often had little control. Despite this, participants demonstrated high levels of competency. They had acquired new skills and knowledge through training and brought critical ‘insider’ understanding to overdose events and the resuscitation actions which they applied.

Conclusions: People who use opioids can be trained to respond appropriately to opioid overdoses and thus to save their peers’ lives. Overdose response requires both practical competency (e.g. skills and knowledge in administering basic first aid and naloxone) and social competency (e.g. willingness to help others, having the confidence to be authoritative and make decisions, communicating effectively, and demonstrating compassion and care to victims post-resuscitation).

KEYWORDS

OVERDOSE; NALOXONE; TAKE-HOME NALOXONE; OVER-ANTAGONISM; CARDIO PULMONARY RESUSCITATION; COMPETENCY; TRAINING; QUALITATIVE

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INTRODUCTION

More than 100,000 opioid overdose deaths occur globally per annum.^[1] In the United States (U.S.), there were 63,632 overdose deaths in 2016, of which 42,249 were attributable to prescription or illicit opioids.^[2] Drug overdose deaths more than tripled between 1999 and 2016, and the rate continues to increase.^[2,3] Timely administration of the opioid antagonist naloxone can reverse respiratory depression related to opioid overdose, preventing fatalities.^[4] Naloxone has been used in emergency settings for many years^[5,6] and is now available to non-medically trained people, including people who use opioids, their friends and family.^[7-9] Naloxone pre-provision, with instruction on management of the overdose crisis while awaiting emergency medical care, is known as take-home naloxone (THN).

THN programs exist in many countries, including the United States.^[8,10,11] Programs are supported by World Health Organization guidelines^[12] and endorsed by the United Nations.^[13] Evidence suggests that providing people who use opioids with overdose training increases their knowledge of overdose risk factors, signs, and responses^[14-19], that people who use opioids can and will use naloxone to reverse overdoses when trained^[18,20-22], and that naloxone distribution to people who use opioids reduces mortality^[23,24] and is cost-effective.^[25,26] Despite this, most countries do not have naloxone programs and countries that do have programs have differing policies, training and provision that can be constrained by national and local legal and regulatory frameworks, as well as costs.^[27,28] For example, naloxone ampoules for intramuscular or multi-step atomized nasal administration are currently cheaper and more widely provided internationally than the new single-step purpose-designed concentrated naloxone nasal sprays now entering the U.S., Australian and European markets.^[8]

Other factors impeding THN implementation have been reported and include negative public

attitudes and the stigma associated with opioid consumption, which can discourage professionals from providing, and users from requesting, naloxone.^[28-30] There have also been reports that people who use opioids are not able to recognize and respond to overdoses reliably^[29-34] and may be reluctant to administer naloxone because they are anxious about police involvement, needle stick injuries, being too intoxicated, or intervening when a victim does not want help.^[30,35] Research has additionally indicated that peers trained in overdose response may continue to use non-evidence-based strategies alongside recommended strategies^[18,21,36] and that they may be deterred from using naloxone because it can prompt withdrawal symptoms which make victims aggressive ('over-antagonism').^[37] Furthermore, studies have suggested that THN might reduce ambulance call-outs resulting in fatalities from the recurrence of respiratory depression if lay first-responders leave victims unattended^[18,38-40]; although this has also been refuted.^[15,41,42]

Given these uncertainties, we need to know more about how opioid users who are trained in naloxone actually react when an overdose event occurs. This is vital to inform the planning and provision of effective THN, particularly as new naloxone formulations and delivery systems are developed, laws expanding naloxone access are passed, and interventions to safeguard individuals from certain criminal sanctions if they report an overdose 'in good faith' (known in the U.S. as Good Samaritan Laws) are increasingly implemented.^[43] With few exceptions^[35,44-46], information on how people who use opioids respond when they witness an overdose derives from quantitative studies which provide limited insights into how and why specific actions were taken.^[20,33,39,47-50] This paper draws upon detailed first-hand accounts of how opioid users who had recently participated in a THN program responded when confronted with an overdose emergency. By systematically analyzing their actions and decisions, we aim to increase understanding of the competencies required and demonstrated.

METHODS

We designed a qualitative study to supplement findings from a randomized controlled trial of overdose education and naloxone prescribing to individuals with opioid use disorder. Both the qualitative study and the trial received ethical approval from the New York State Psychiatric

Institute (NYSPI) Institutional Review Board (IRB# 6723) and were conducted in New York City, where a Good Samaritan Law had been in operation since 2011. Trial participants received brief or extended overdose training and injectable or nasal naloxone. Brief training typically took 20-30 minutes and included overdose risk factors (e.g. mixing drugs), how to recognize an opioid overdose (e.g. blue lips or nail beds) and a demonstration on how to use naloxone. Extended training comprised the brief training plus an additional two-hour session that reiterated and reinforced key information from the brief training, provided further information about non-opioid overdose, and taught cardio pulmonary resuscitation. Both the brief and extended training were conducted at Columbia University Medical Center by one of two research assistants who followed a manual/written script to ensure every participant received exactly the same information (see Box 1 for additional trial details).

BOX 1

Between January 2016 and October 2017, 45 trial participants reported being present at an overdose and they all expressed interest in completing an optional qualitative interview. All 45 were consequently provided with additional information on the interview process and given an interview date and time. Five (4 men; 1 woman) did not attend on the day; the other 40 (33 men; 7 women) undertook further consent procedures and were then interviewed in private offices at the NYSPI by members of the research team who were trained in qualitative interviewing (A.N.C.C, J.D.J., V.E.M.). Interviews were semi-structured, audio-recorded, lasted 20-65 minutes, and followed a topic guide that covered: demographic and psychosocial information, substance use and treatment, pre-trial overdoses experienced and witnessed, the last overdose witnessed since joining the trial, and views on overdose training. Core questions relating to the last overdose witnessed are shown in Box 2. These were supplemented by prompts and probes to ascertain further details. Participants were compensated \$40.

BOX 2

Interviews were transcribed verbatim and the encrypted anonymized transcriptions were emailed to the research team in London. Here they were entered into MAXQDA v11^[51] for systematic

coding. The coding frame comprised deductive codes based on the topic guide and more inductive codes emerging from the data. For consistency, one member of the team (C.B.) coded all data and the process was checked by J.N. To meet the aims of this paper, all data coded to eight codes relating to the last overdose witnessed were analyzed (Box 3).

BOX 3

The coded data were first exported into eight Microsoft Word documents and each Word document was inductively analyzed via Iterative Categorization.^[52] This generated patterns and themes relating to participants' actions and decisions. As the patterns and themes overlapped across the documents, all findings were merged into one document and the patterns and themes were re-organized and re-grouped. This yielded five core overdose response tasks, now informed by accounts of how and why participants had responded as they had. Analyses were undertaken by J.N. and discussed with other team members.

Participants

Data from 39 of the 40 participants (32 men, 7 women; ages 22-58 years) were analyzed. One participant was excluded as he had experienced, rather than witnessed, an overdose. The 39 included participants had a recent history of heroin use and 14 were current injectors. Nineteen reported that they had ever overdosed themselves. Most interviews were conducted within 2 months of the witnessed overdose (range 1 day to 6 months) and victims included partners, relatives, friends, acquaintances and strangers. Thirty-six participants administered naloxone (31 used a multi-step atomized nasal spray; 5 used intramuscular naloxone) and 29 called the emergency services. In 38/39 cases the victim was successfully resuscitated; the outcome of one overdose was unknown as the participant administered nasal naloxone but then left as soon as the emergency services arrived. Additional participant and overdose reversal details are shown in Table 1.

TABLE 1

FINDINGS

The core overdose response tasks identified during the analyses were: 1. Overdose identification; 2. Mobilizing support; 3. Following basic first aid instructions; 4. Naloxone administration; and 5. Post-resuscitation management. These are described below, illustrated by quotations labelled with the participant's qualitative study identifier and sex.

Task 1: Overdose identification

Participants generally reported that they had been alerted to an overdose on either hearing a bystander call for help or seeing somebody staggering, falling over, or lying on the ground. Very few participants described hesitating before investigating further. One woman said that she had not known the victim so was initially unsure about whether to get involved and one man reported wavering because he was worried he might be evicted from the shelter where he was living if the shelter staff realized he was using drugs. In contrast, most participants explained that they had immediately rushed over to the incident or had observed the situation for a few moments before intervening:

“His friend was... hitting him and he would not wake up... I was watching him hit him... I was like, ‘Dude, he’s really fucking wrecked’. That’s when I went over.” (#11 female)

Several participants emphasized that they were keen to intervene in any emergency as they wanted to help others. For example, one woman said she always looked for people overdosing, one man said that he had been looking forward to saving a life since joining the trial, and another man said he would always intervene as that is just ‘the type of person’ he is:

“Just because of the type of person I am... I always carry my kit [naloxone].” (#30 male)

Whilst some participants stressed that they could instantly recognize an opioid overdose as they had seen so many previously, others acknowledged that they had found it difficult to tell if the victim was overdosing or just heavily intoxicated, particularly if they did not know the victim, what they had used, their tolerance, or their usual behavior. Some participants reported that they had suspected an overdose based on the victim's demeanor (e.g. snoring, not responsive), the location (e.g. toilet, stairwell, known drug spot) or other circumstantial factors (e.g. person taking 'too long' in the bathroom, the victim or others present were known heroin users, fentanyl in the area). Participants then described additional signs that confirmed their assessment; e.g. the victim was changing colour, had blue lips or small pupils, was 'foaming' at the mouth, remained unresponsive after being slapped, was breathing shallowly or not at all, or was behaving oddly. Evidence of drugs (e.g. tourniquet, needle, track marks, drugs lying around) provided additional corroborating evidence:

"Being around that area, I figured it was an overdose... It was a men's bathroom, so I just went in to check. As I opened the stall door it was a guy sitting there with a needle stuck in his arm and he was passed out. So I immediately knew it was an overdose because he was foaming out the mouth and he was snoring real loud." (#16 male)

Having decided that an overdose had occurred, participants occasionally reflected on what drugs had likely been taken and what might have been the cause so that they could respond effectively or pass this information to the emergency services. To this end, participants questioned the victim, drew their own conclusions based on their knowledge of the victim or their assessment of the scene, or asked others present for details:

"I asked, 'How long she been there? What happened?' They [bystanders] said, 'She ain't been in that long'... They knew she was an IV [intravenous] user." (#28 female)

Task 2: Mobilizing support

Once an overdose had been confirmed, participants frequently described how they had taken

charge of the situation (e.g. instructing others to fetch their naloxone, call the emergency services or reposition the victim). Sometimes participants justified their authority by telling others that they had completed training and so were ‘qualified’. One participant explained that he had taken control because his friend was panicking:

“He [friend] was just panicking, like, ‘Oh my God, dude, what’s going on?’ Like ‘Is he alright?’ Like ‘Call the police’. And I was like, ‘Well alright, we’re going to call the police, but let me just do this first because I’m trained in this.’ And I just administered the first dose [naloxone].” (#36 male)

Additionally, several participants described working in conjunction with other bystanders to resuscitate the victim. These bystanders included friends or relatives of the victim or the participant, other substance users, shelter workers, security guards, and passersby:

“We [participant and bystander] were working together... I gave her [victim] the nasal [naloxone] and we just kept on performing [cardio pulmonary resuscitation]. And she [bystander doing chest compressions] was tiring, but she kept on. We started, did the mouth [rescue breathing] until the ambulance got there.” (#6 male)

Participants often reported that they had called 911 (the emergency services), or told somebody else to call 911, as soon as they had realized there was a medical emergency. Others stated that they had called 911 just before, or immediately after, they had given naloxone, and two reported that they had phoned 911 whilst administering naloxone. Participants gave three main reasons for calling 911: they had been told to do this in their training; they felt they needed professional support in case the victim died; and they were worried that the victim might go back into the overdose if they did not receive medical attention after naloxone was administered.

Sometimes, however, participants said that they had not called 911 because the victim had told them not to; they believed they had the situation under control; or they were afraid of ‘getting into trouble’, ‘having their name written down by the authorities’, being arrested, being imprisoned, being evicted from their shelter, or drawing unwanted attention to themselves:

“I would have called them [911] if I couldn’t have woken him up. But... I knew he was gonna be alright once I gave him that stuff [naloxone]... If I thought that he was really at risk of anything I would’ve definitely called the ambulance.” (#30 male)

Countering these concerns, several participants were confident that, according to the training they had received, the police could not take any action against them for administering naloxone or for being present at an overdose, particularly if they showed their overdose training identification card.

Task 3: Following basic first aid instructions

Participants routinely explained that they had tried hard to follow the first aid instructions they had been given in their training. A few said that they had felt confident and prepared, that their training had ‘just kicked in’, or that they had instinctively known what to do, particularly if they had successfully resuscitated someone previously:

“Stuff that I’ve learned in the past... It’s just one of those things where you know what it is, and you know how to do it.” (#33 male)

Others stated that they had felt anxious but had still remembered what they had been taught. Some, however, confessed that they had frozen or panicked. In consequence, they said that they had forgotten aspects of the training or were uncertain whether they had done things ‘correctly’ or in the right order. Despite this, most reported that they had first tried to wake the victim, usually by shouting or slapping them hard, commonly across the face. Others had shaken the victim in a more controlled way or performed a sternum rub. Only a few participants said that they had used cold water or ice to shock the victims awake. Meanwhile, several reflected on techniques they had previously used (e.g. injecting salt or giving victims milk or oil to drink), noting that they would no longer use these after learning of their ineffectiveness during their training:

“I was gonna tell him to give him milk. I said, ‘Wait a minute. I got the Narcan

[naloxone]... that will snap him out of it'." (#35 male)

Participants generally reported that they had also checked the victim's breathing. For this, they had used a range of techniques, e.g. listening; looking for the rise and fall of victim's chest; placing a hand over the victim's nose and mouth; or using their phone screen, cellophane wrapping from a cigarette packet or a compact mirror to look for signs of breath via condensation:

"I put my phone under his nose before I took him off the toilet... there was really nothing, no condensation on the phone." (#18 male)

Less commonly, participants described checking the victim's pulse, performing chest compressions, giving rescue breaths or placing the victim in the recovery position. Some participants reported that they had not performed mouth-to-mouth as the victim was still breathing. Others explained that they would not initiate rescue breathing because the victim had 'foam' coming from their mouth, they did not want their lips to 'touch others' lips', or they were anxious about AIDS. Several participants also explained that they had been worried about performing chest compressions as they did not feel adequately trained. Furthermore, administering naloxone was described as easier and more essential than other first aid stages:

"I didn't try to give her no mouth-to-mouth... I thought it was best to just go ahead and just do it [naloxone] right away. See what happened." (#28 female)

Task 4: Naloxone administration

Participants sometimes explained that it had taken them a few minutes to remember that they had naloxone and could use it. Administration was then further delayed if participants had to return to their home, shelter room, or car to retrieve it. Others had their naloxone with them in a bag or pocket but did not use it immediately. Instead, they consciously considered whether and, if so when, administration would be appropriate. Occasionally, participants said that they had hesitated because they had felt uncertain or nervous. Indeed, one participant said he was so anxious that he

had given his naloxone to a bystander to administer:

“I just bring the thing [naloxone] to him [bystander]. I said ‘Yo, if you need this, you just got to put it in his nose and he gonna wake up’.” (#20 male)

More commonly, participants explained that they had been reticent to give naloxone as it could prompt the victim to experience withdrawal symptoms and the victim would then be angry on regaining consciousness. Reflecting this, a few participants emphasized that they would not give naloxone unless it was essential, and the victim was unresponsive, not breathing, blue, or likely to die. In contrast, others rationalized that they might as well give naloxone as they had been told in the training that it could do no harm. Furthermore, two participants had felt confident enough to administer naloxone even though professionals (a 911 operator and shelter worker respectively) had advised them against this:

“When we called 911... they said, ‘Don’t do anything’. And I’m like, ‘Well... if I’m up on somebody and I have naloxone and they need it... if they look like they’re dying, I’m going to help them’.” (#7 female)

Having resolved to administer naloxone, participants recounted how they then had to decide where and how to position the victim. This could involve carrying them from a bathroom, moving them from a shelter, lying them flat, or propping them up. Repositioning was complicated if a victim still had a needle in their arm as this then had to be removed invoking fears of a needle stick injury. If victims were heavy or awkwardly positioned, participants sometimes needed others to physically help them. Compounding these practical difficulties, several participants reported that they had struggled to assemble their nasal naloxone kit:

“I actually forgot how to put it together... They have the instructions on the bag... I read the instructions and now I’m... kinda freakin out. I get it together and I give her the shot.” (#17 male)

Mostly, participants explained that they had followed what they had been told in the training about

giving half a dose of nasal naloxone in each nostril and then waiting before re-dosing. If the first dose did not revive the victim, participants usually said that they had administered a second dose. However, there was considerable variability in the length of time participants left between doses (0 to 15 minutes). Even when participants remembered that they had been told to wait between doses, they often gave the second dose immediately because the victim did not regain consciousness instantly and that worried them. Sometimes, a second or third dose was given ('to be on the safe side') even though the victim had already regained consciousness:

"She was breathing, but it was very, very labored, so that's why I administered the second one [dose]. Because she didn't come out of it with the first one." (#33 male)

Occasionally, participants rationalized that the victim needed two doses of nasal naloxone because they had used a large quantity of drugs, and a few stated that if the victim became angry because they went into withdrawal, that would 'just be too bad'.

Task 5: Post-resuscitation victim management

Participants often described how the victim had been confused, disorientated, frightened or angry on regaining consciousness. In response, they had mostly told the victim what had happened, even though they had anticipated that the victim would be angry because the naloxone would have 'taken away their high', 'wasted their drugs', and potentially 'put them into withdrawal'. Accordingly, information on naloxone administration was imparted sensitively to the victim and often with reassurance that they would soon feel alright, but they must not use more drugs in case they overdosed again. Furthermore, they should now receive professional medical attention. Participants also sometimes used this moment to ascertain more information from the victim about who they were and what had happened, or to give the victim general advice (e.g. about seeking treatment or not using drugs alone in the future):

"I said, 'You, in a couple hours, two maybe three hours, that Narcan is gonna wear out and you're gonna be in that same position where you was at when I gave it to you'. I said, 'You

won't be OD'ing but you gonna be very, very high. So, if you don't want to go to the hospital, don't get high'." (#35 male)

Although most participants seemed to recognize if the victim was experiencing withdrawal symptoms, several said that the victim was sweating or vomiting and they did not know why (a few attributed vomiting to fentanyl in the drugs taken). Sometimes participants disposed of leftover drugs or withheld them from the victim in case they tried to take more. However, on a few occasions, participants – who said that they understood the pain of withdrawal symptoms – had provided the victim with more opioids a few hours later to help them manage their symptoms. For example, one female participant gave her husband a bag of heroin without which she said he would have been too unwell to travel to his treatment program, and a male participant took drugs to the hospital after the victim had pleaded with him for something to help until he received his prescribed methadone:

“About two hours later, he called me and begged me, like, ‘Bro, you have no idea. These people not going to get me methadone until tomorrow. I’m fucking dying...’ I know... that desperation. Like you’ll fucking rob the doctor’s computer if you have to... The bags [of drugs] that I had found, I kept them... then I brought him one. He kind of relaxed.” (#19 male)

Whilst most participants reported that they had stayed with the victim as they were recovering, a small number left as soon as they were certain the victim was alright, or the emergency services/ambulance had arrived. These participants tended to be anxious about the police arriving or were worried that the victim might get aggressive if they went into withdrawal. Participants who stayed generally reported that they had told emergency service personnel everything they could about what had happened. Nonetheless, a few said that they had refused to give out details, preferring to tell officials as little as possible. Often, participants explained that the victim had been reluctant, or had refused, to wait for the ambulance. Nonetheless, some had successfully persuaded victims to attend hospital for further assessment. Occasionally, the participant had gone with the victim in the ambulance or visited them later (even if the victim was a stranger) to check they were safe:

“When he seen them [emergency services personnel] walk through the door, he was like, ‘No, no, no. I don’t need them’... I said, ‘Listen... You’re going with them. I’ll go with you, but you’re going.’ And he went with the flow. He allowed that.” (#18 male)

DISCUSSION

Competence can be defined as the relationship between people’s abilities or capabilities and the satisfactory completion of appropriate task(s).^[53] We identified 5 core overdose response tasks, each requiring actions and decisions. These actions and decisions were in turn affected by: i. *cognitive ability* (e.g. to recognize the signs of overdose and remember the training received); ii. *emotional reactions* (e.g. panic, nerves, fear of the victim dying, anxiety about getting into trouble with the authorities despite the local Good Samaritan Law, revulsion at giving rescue breaths); iii. *prior personal experiences* (e.g. previous witnessed or experienced overdoses which increased confidence in recognizing and responding); iv. *interpersonal relationships* (e.g. knowledge of the victim, respecting the victim’s wishes not to call 911, wanting to reassure, care for and advise the victim); and v. *situation* (e.g. who else was present to assist, where the overdose occurred, whether naloxone was close to hand).

Our findings thus show that the ability to act ‘competently’ in an overdose emergency is influenced by myriad factors over which a lay first responder may have little direct control. This more complex, and less ‘agentic’, view of competency resonates with a recent shift in health education towards the concept of ‘structural competency’.^[54] Structural competency recognizes that medical problems and their treatment (in this case opioid overdose and its response) cannot be divorced from *a priori* social, political and economic forces that contribute to ill-health and poor health choices. Stigma, criminalization, homelessness, and lack of education are all implicated in drug problems^[55-58], but also impede an individual’s ability to respond effectively to drug overdose.^[58,59] Participants routinely overcame these hurdles to be ‘good citizens’, ‘take charge’, provide advice, behave in a caring way, and ultimately save lives.^[see also 46] This is consistent with wider international evidence that people who use opioids are responsible and capable individuals who

routinely deliver interventions (including mutual aid, recovery enterprises, and harm reduction initiatives) to help their peers.^[60]

Furthermore, the analyses undertaken have revealed how people who use opioids bring critical ‘insider’ knowledge and understanding (‘competency by experience’) to overdose events. This includes their ability to rapidly assess a scene for signs and symptoms of overdose, anticipate and empathize with a victim’s withdrawal symptoms, withhold or titrate a naloxone dose depending on the drugs likely taken, communicate effectively with a confused victim, and persuade a reluctant patient to accept professional medical care. Additionally, participants demonstrated how they had acquired new skills and knowledge from their training, were willing to prioritize this new formal knowledge above non-evidence-based strategies they had used in the past^[contrary to 21], and felt empowered by their ability to respond.^[36,44,61,62]

This is not to suggest that participants did not make errors or questionable judgments. Some panicked, forgot tasks or completed them in a random order, struggled to assemble the nasal naloxone kit, administered more naloxone than was probably necessary, left the scene at the earliest opportunity, and refused to communicate with emergency services personnel or other officials. Nonetheless, actions and decisions that might have appeared ‘incompetent’, ‘irresponsible’ or even ‘wrong’ (e.g. administering naloxone against professional advice, managing an overdose without calling the emergency services, or providing additional opioids to counter over-antagonism) merit closer inspection. It is possible that participants were demonstrating high levels of competency (administering naloxone completely appropriately, avoiding a genuinely unnecessary ambulance call out, or protecting somebody from totally avoidable painful withdrawals). If similar actions and decisions had been made by a medical professional, we might regard them as demonstrating confidence, knowledge and skill.

Opioid users who have personally responded to an overdose have valuable insights and experience and can play an important role in delivering THN programs because they can help their peers understand what actually happens and how lay first-responders feel during and after an overdose event. Notably, two participants successfully administered naloxone contrary to professional advice and another took drugs to a hospitalized victim because hospital staff would not provide

methadone to ease his withdrawals until the following day. Professionals working in health and social care-related services (including 911 operators and shelter staff) also have overdose training needs and might similarly benefit from training that incorporates the first-hand accounts of people who have witnessed overdose emergencies. Furthermore, hospital-based harm reduction interventions that acknowledge the subjective health needs and experiences of people who use drugs (e.g. the provision of rescue opioids in the event of naloxone over-antagonism or rapid access to opioid assisted treatment) might increase post overdose hospital attendance and retention, promote patient-centred care, and ultimately reduce adverse health outcomes.^[37,63]

Limitations and strengths

We successfully interviewed 40/45 (89%) trial participants who reported being present at an overdose and 39/44 (89%) trial participants who had witnessed an overdose during their time in the trial. Nonetheless, it is possible that the 40 individuals who were interviewed were more likely to believe they had acted responsibly and appropriately, and were therefore more willing to speak about their actions and experiences, than the 5 who were not interviewed. Equally, there may have been other trial participants who did not report that they had been present at an overdose because they had not intervened, had left a victim without calling the emergency services, or had acted unsuccessfully. Our qualitative study may thus have failed to access information on people who did not demonstrate competency despite their training. This does not invalidate our findings, but reminds us not to draw any empirical generalizations from the analyses presented.

In addition, most participants were men and most used a multi-step atomized nasal spray. Consequently, we are unable to analyze the data by gender or type of naloxone used. New purpose-designed nasal sprays, which do not generate the difficulties some participants identified in assembling the multi-step devices, are now available in the U.S.^[64] However, both the cheaper injectable formulations and the cheaper improvised nasal kits are likely to be used internationally for years to come. The data presented therefore retain currency despite recent technological advances in naloxone provision. Also, we have not considered how the training received (brief or extended) influenced competency as this will be reported separately once the RCT is complete. As

previously stated, the aim of this paper was to better understand competency; not measure it. A key strength of our analyses is that all data were collected within six months, and sometimes a few days, of an overdose occurring, so generating uniquely detailed accounts of what actually happened and why.

CONCLUSIONS

Analyses of the actions and decisions taken during recently witnessed overdoses have provided insights into exactly how opioid users who had been trained in THN responded when confronted with a medical emergency. We identified five core overdose response tasks: 1. Overdose identification; 2. Mobilizing support; 3. Following basic first aid instructions; 4. Naloxone administration; and 5. Post-resuscitation management. Our findings suggest that responding to overdose events requires both practical competency (e.g. skills and knowledge in administering first aid and naloxone) and social competency (e.g. willingness to help others, having the confidence to be authoritative and make decisions, communicating effectively with all present, and demonstrating compassion and care to victims post resuscitation).^[see also 46] People who use opioids are routinely stigmatized and associated with incapacity and the harms they cause.^[55,65-68] The data presented counter such perceptions by demonstrating how they can be skillful, knowledgeable and caring, as well as willing and able to save lives.^[see also 46,58,62]

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BOXES AND TABLES

Box 1: Trial details and study context

Name: Risk and benefits of overdose education and naloxone prescribing to heroin users

Dates: September 2014 – August 2019

Funder: National Institute on Drug Abuse: R01DA035207

Principal Investigator: Sandra D. Comer, Ph.D.

Primary Aim: To determine the extent to which more extensive overdose education may improve overdose outcomes compared to brief overdose education.

Recruitment criteria: Male or female 21-65 years of age; meet DSM-5 criteria for opioid use disorder within the past 6 months regardless of current treatment status; speak/read English; no active psychiatric disorder that might interfere with participation; no naloxone or cardio pulmonary resuscitation training within past 2 years.

Trial context: New York City (NYC), NY, USA. Mirroring national trends, overdose rates in NYC continue to rise. NYC formalized overdose education and naloxone distribution in 2006. In 2011, NYC introduced a Good Samaritan Law providing a limited shield from charge and prosecution when emergency services are notified of a potential overdose event.

Types of training received by trial participants: Prior to receiving naloxone in NYC, individuals must complete brief overdose training which addresses overdose risk factors, how to recognize an opioid overdose and how to use naloxone. Participants in the trial received this brief training or extended training. Extended training comprised the brief training plus an additional two-hour session that reiterated and reinforced key information from the brief training, provided additional information about non-opioid overdose, and taught cardio pulmonary resuscitation.

Type of naloxone available to trial participants: At the start of the trial, participants were offered the choice of an intramuscular naloxone formulation (1 mL naloxone vial + syringe [3 cc/mL, 22G]) or a multi-step atomized nasal naloxone spray (2mg/2 mL Luer-Jet™ Luer-Lock needleless naloxone syringe plus mucosal atomizer device [MAD-300]). In 2015, the U.S. Food and Drug Administration approved a single-step nasal naloxone formulation (NARCAN® NASAL SPRAY). Although participants subsequently recruited to the trial were offered the single-step formulation, the qualitative study participants were all recruited before the single-step formulation was available.

Clinicaltrials.gov: NCT02535494

Box 2: Core questions relating to the last overdose

- i. What happened?
- ii. How was the overdose was recognized?
- iii. Who made the decisions?
- iv. Was cardio pulmonary resuscitation (CPR) performed?
- v. Was naloxone given?
- vi. Were the emergency services called?
- vii. What happened after the overdose?

Box 3: Codes analysed

- i. What happened at the last overdose
- ii. Recognizing the last overdose
- iii. Deciding what to do at the last overdose
- iv. Cardio pulmonary resuscitation at the last overdose
- v. Naloxone administration at the last overdose
- vi. Calling the emergency services at the last overdose
- vii. Non-evidence-based responses at the last overdose
- viii. Other aspects of the last overdose

Table 1: Participant and overdose information*

Characteristic	Participant
Gender	
Male	32
Female	7
Age (years)	
Mean (range)	45 (22-58)
Ethnicity	
Hispanic/Latino	15
Black/African American	14
White American	8
Asian	1
Mixed Race	1
Current injector	
Yes	14
No	25
Had personally experienced an overdose prior to joining the trial	
Yes	19
No	15
Missing	5
Had witnessed an overdose prior to joining the trial	
Yes	34
No	4
Missing	1
Type of naloxone administered at the last witnessed overdose	
Intranasal (multi-step atomized nasal spray)	31
Intramuscular	5
None**	3
Emergency services called at the last witnessed overdose	
Yes	29
No	10
Victim survived the last witnessed overdose	
Yes	38
Unknown as participant left once the emergency services arrived***	1

* The type of training participants received (brief or extended) is blinded to the research team to preserve the integrity of the trial analyses.

** One participant gave rescue breaths which revived the victim until the emergency services arrived and took over; one participant did not have his naloxone with him so called a security guard and asked them to phone for an ambulance; and one participant called the emergency services because he was anxious about going into the shelter where he lived to collect his naloxone in case staff evicted him for using substances.

*** On balance it seems likely that the victim survived as the participant reported that they had given one dose of nasal naloxone and the victim had momentarily come out of the overdose but then went back into the overdose just before the emergency services arrived.